

# Appendix H: Federal Correctional Institution—Phoenix Case Study: ESPC Economic Analysis

SCENARIO: THE SOLAR SYSTEM IS OWNED AND OPERATED BY AN ESCO

SYSTEM: Parabolic Trough Solar Water Heating System with Electric Resistance Backup

SYSTEM INSTALLED COST (Gross):	\$650,000
SYSTEM INSTALLED COST (net of 10% tax credits and buydown):	\$585,000
ANNUAL ENERGY REQUIREMENT(kWh):	1768000
SOLAR COLLECTOR AREA(sq ft):	18000
ANNUAL ENERGY REQUIREMENT(kWh):	1432591
AMOUNT OF SYST COST FINANCED:	\$585,000
FIRST YR ELECTRICITY COST(\$/kWh):	0.062
MORTGAGE:	18.5 years @ 9.5%
ELECTRICITY COST INFLATION RATE:	3%
ANNUAL MORTGAGE PAYMENT:	\$67,741
GENERAL INFLATION RATE:	3%
DISCOUNT RATE (Real):	3.40%
Electricity Savings Going to ESCO (%):	90%
FIRST YR INSURANCE COST(\$):	\$10,022

YEAR NO.	YEAR	ELEC COST INFLATION FACTOR	ANNUAL VALUE OF ELECTRICITY SAVINGS	ANNUAL SAVINGS GOING to GOVERNMENT	ANNUAL REVENUE for ESCO(\$)	GOVERNMENT PAYMENT and TAX CREDITS	TOTAL AVAILABLE CASH for ESCO	GENERAL INFLATION FACTOR	O&M EXPENSE	INSURANCE EXPENSE	CAPITAL REPAYMENT	INTEREST EXPENSE	LOAN BALANCE	DEPRECIATION	GROSS ANNUAL PROFIT	GROSS CASH FLOW	NET ANNUAL PROFIT	NET CASH FLOW
0	1997	1.00	\$0	\$0	\$0	\$108191		1.00	\$0	\$0	\$0	\$0	\$585000			-\$541809		-\$541809
1	1998	1.03	\$45743	\$4574	\$41168	\$0	\$41168	1.03	\$2318	\$5161	\$33871	\$27788	\$578917	\$29250	-\$23348	\$29250	\$0	\$29250
2	1999	1.06	\$94230	\$9423	\$84807	\$0	\$84807	1.06	\$4774	\$10632	\$67741	\$54997	\$566173	\$222300	-\$207897	\$222300	\$0	\$222300
3	2000	1.09	\$97057	\$9706	\$87351	\$0	\$87351	1.09	\$4917	\$10951	\$67741	\$53786	\$552219	\$134550	-\$116854	\$134550	\$0	\$134550
4	2001	1.13	\$99968	\$9997	\$89972	\$0	\$89972	1.13	\$5065	\$11280	\$67741	\$52461	\$536938	\$81900	-\$60734	\$81900	\$0	\$81900
5	2002	1.16	\$102967	\$10297	\$92671	\$0	\$92671	1.16	\$5217	\$11618	\$67741	\$51009	\$520206	\$64350	-\$39523	\$64350	\$0	\$64350
6	2003	1.19	\$106056	\$10606	\$95451	\$0	\$95451	1.19	\$5373	\$11967	\$67741	\$49420	\$501885	\$52650	-\$23959	\$28691	\$0	\$52650
7	2004	1.23	\$109238	\$10924	\$98314	\$0	\$98314	1.23	\$5534	\$12326	\$67741	\$47679	\$481823	\$0	\$32775	\$32775	\$22615	\$22615
8	2005	1.27	\$112515	\$11252	\$101264	\$0	\$101264	1.27	\$5700	\$12696	\$67741	\$45773	\$459855	\$0	\$37095	\$37095	\$25595	\$25595
9	2006	1.30	\$115891	\$11589	\$104302	\$0	\$104302	1.30	\$5871	\$13076	\$67741	\$43686	\$435801	\$0	\$41668	\$41668	\$28751	\$28751
10	2007	1.34	\$119368	\$11937	\$107431	\$0	\$107431	1.34	\$6048	\$13469	\$67741	\$41401	\$409461	\$0	\$46513	\$46513	\$32094	\$32094
11	2008	1.38	\$122949	\$12295	\$110654	\$0	\$110654	1.38	\$6229	\$13873	\$67741	\$38899	\$380618	\$0	\$51653	\$51653	\$35641	\$35641
12	2009	1.43	\$126637	\$12664	\$113973	\$0	\$113973	1.43	\$6416	\$14289	\$67741	\$36159	\$349036	\$0	\$57110	\$57110	\$39406	\$39406
13	2010	1.47	\$130436	\$13044	\$117392	\$0	\$117392	1.47	\$6608	\$14718	\$67741	\$33158	\$314454	\$0	\$62908	\$62908	\$43407	\$43407
14	2011	1.51	\$134349	\$13435	\$120914	\$0	\$120914	1.51	\$6807	\$15159	\$67741	\$29873	\$276586	\$0	\$69075	\$69075	\$47662	\$47662
15	2012	1.56	\$138380	\$13838	\$124542	\$0	\$124542	1.56	\$7011	\$15614	\$67741	\$26276	\$235120	\$0	\$75641	\$75641	\$52192	\$52192
16	2013	1.60	\$142531	\$14253	\$128278	\$0	\$128278	1.60	\$7221	\$16082	\$67741	\$22336	\$189716	\$0	\$82638	\$82638	\$57020	\$57020
17	2014	1.65	\$146807	\$14681	\$132126	\$0	\$132126	1.65	\$7438	\$16565	\$67741	\$18023	\$139998	\$0	\$90101	\$90101	\$62169	\$62169
18	2015	1.70	\$151211	\$15121	\$136090	\$0	\$136090	1.70	\$7661	\$17062	\$67741	\$13300	\$85557	\$0	\$98068	\$98068	\$67667	\$67667
19	2016	1.75	\$155748	\$15575	\$140173	\$0	\$140173	1.75	\$7891	\$17574	\$67741	\$8128	\$25943	\$0	\$106580	\$106580	\$73541	\$73541
20	2017	1.81	\$160420	\$16062	\$144378	\$0	\$144378	1.81	\$8128	\$18101	\$67741	\$0	\$0	\$0	\$118150	\$118150	\$81523	\$81523
TOTALS				\$241250			\$2171251		\$122227	\$272212	\$67741			\$585000	\$497659	\$1531015	\$669282	
INTERNAL RATE OF RETURN FOR ESCO(%)															14%		12%	